
# Methods of dismantling and decontamination applied during Ignalina's NPP decommissioning . Dismantling and decontamination technologies for the Ignalina NPP nuclear facilities.

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**Technical Seminar No.1 Dismantling of nuclear facilities**,
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*Head of Dismantling and Decontamination Projects Engineering Support Subdivision*

**I have been working at the Ignalina Nuclear Power Plant since 1985.**

**First 14 years I have worked as an operator in different position in the INPP Main Control Room and received invaluable experience of working within an integrated and highly motivated team.**

**Next 10 years I have worked as an senior Instructor in the INPP Training Center.**

**During the last 6 years I have been working within the INPP Decommissioning projects management organization.**

**At the present time I am responsible for the development and organization dismantling & decontamination projects.**



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Content:

- Ignalina NPP in focus
- Decommissioning Strategy
- Methods of dismantling and decontamination applied during Ignalina's NPP decommissioning
- Cutting, dismantling and decontamination technologies and facilities
- Conclusions



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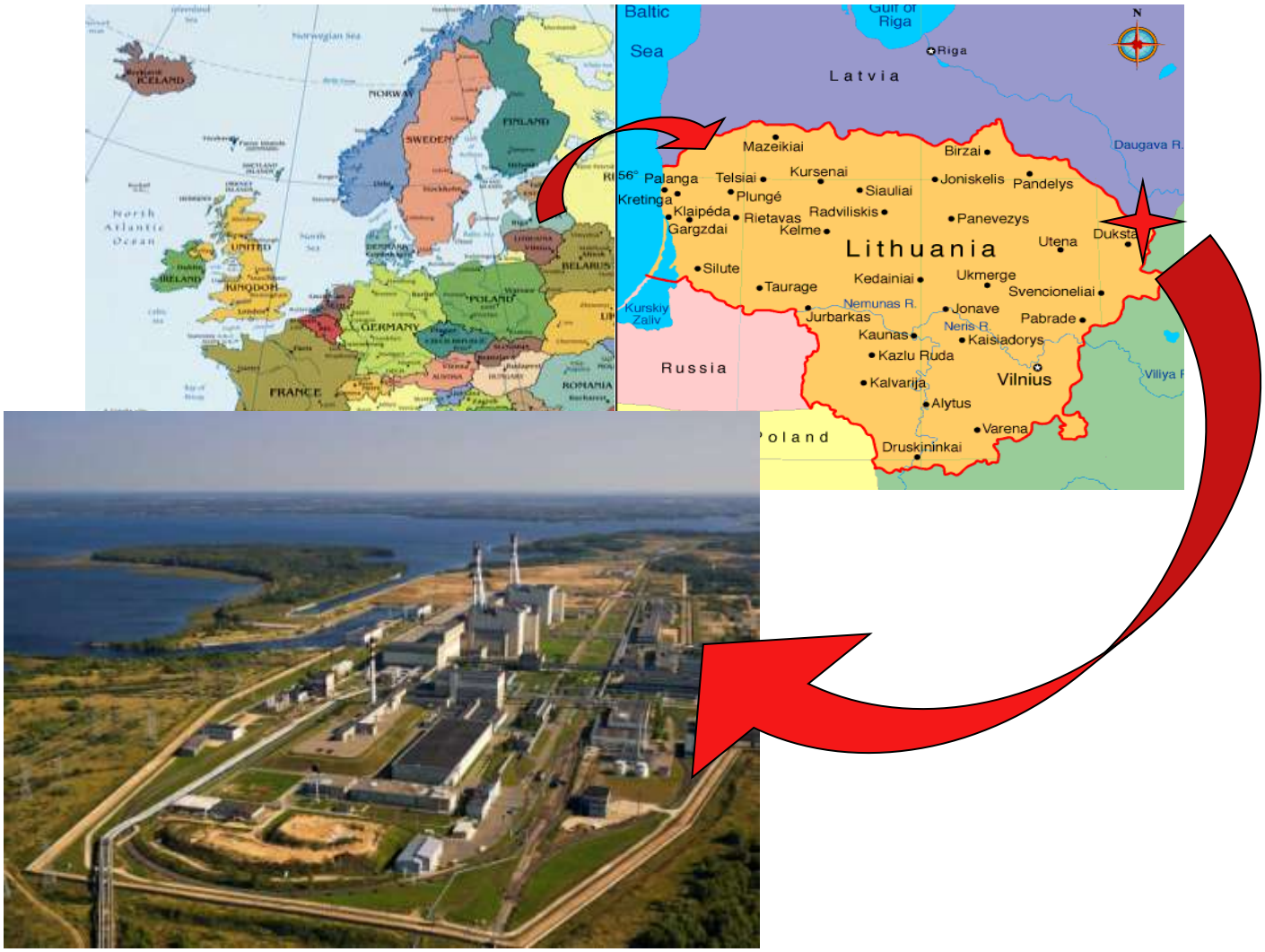
# Europe, Lithuania, Ignalina NPP



# Ignalina NPP in Focus

- Two similar design units of RBMK-1500 water-cooled graphite-moderated channel-type power reactors (1500 MW electrical power)
- The first Unit of INPP was commissioned in December 1983, the second Unit in August, 1987
- Design lifetime 30 years
- Reactor of Unit 1 was shut down 31 December 2004
- Reactor of Unit 2 was shut down 31 December 2009



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# Decommissioning

- **Strategy and plan**
  - Immediate dismantling strategy (Govt. decided)
  - Final Decommissioning Plan issued 2005
  - Use of operational workforce to perform decommissioning

## First RBMK-type reactor to be dismantled

  - Dismantling activities started after full closure
    - Unit 1 from 2010 (**but** fuel still on ponds)
    - Unit 2 from 2014 (**but** some fuel still in core and fuel in ponds)



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# Decommissioning Projects identification

Preliminary Decommissioning Plan (PDP) for the Ignalina NPP (March 2000)

Review

Dismantling Strategy Selection

Final Decom Plan (FDP)
EIA Programme (EIAP)

A1.1 - FDP/SA/EA
A1.2 - Fuel unloading Progamme and SAR – (INPP)
A1.3 - SAR for single Unit 2 operation – (INPP)
A1.4 - Decom Projects for Unit 1 & 2 defuelling

U1/2DP0 – DSAR - DEIA Report

**IIDSF Decom PMU Phase 1 (12/2001 -> 12/2004)**

Terms of Reference

Engineering (A1.X Projects)

Procurement (BX Projects)

B1 - Interim Spent Fuel Storage Facility
B2 - Modernisation of Solid LL waste Handling and Storage
B3 - Incineration Facility for Combustible Waste
B4 - Modernisation of Solid SL waste Handling and Storage
B5 - Replacement of Heating and Steam Plant
B6 - Modernisation of Technical Documentation Archive
B10 – Free Realize facility
B19 – Short-lived VLLW (Class A) Buffer Storage & Landfill facility
B9X – D&D projects

**IIDSF Decom PMU Phase 2 (01/2005 -> 12/2007)**

ToR

INPP Decommissioning Projects Pipeline 2007 -> 2013 (June 2006)

**IIDSF Decom PMU Phase 3 (01/2008 -> 12/2010)**

ToR

INPP Decommissioning Projects Pipeline 2014 -> 2020 (2010)

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# Final Decom Plan (FDP)

Preliminary Decommissioning Plan (PDP) for the Ignalina NPP (March 2000) → Review → Dismantling Strategy Selection → Final Decom Plan (FDP) EIA Programme (EIAP)

The INPP Final Decommissioning Plan (INPP FDP) at Issue 06 was approved in July 2005 by the Lithuanian Ministry of Economy on behalf of the Government of the Lithuanian Republic.

Issue 06 of the INPP FDP was building upon the results of the Preliminary Decommissioning Plan (INPP PDP) drafted in 1999 under a specific EC PHARE project and further took into account the situation prevailing at INPP and in Lithuania as per the years 2002/2003.

Issue 07 of the INPP FDP updates previous version and replaces/complements the given information to account for the conditions prevailing as per mid of the year 2010 and to take on board the progress/results of the various INPP decommissioning projects.

B9X – D&D progects

**IIDSF Decom PMU Phase 2 (01/2005 -> 12/2007)**

ToR → INPP Decommissioning Projects Pipeline 2007 -> 2013 (June 2006)

**IIDSF Decom PMU Phase 3 (01/2008 -> 12/2010)**

ToR → INPP Decommissioning Projects Pipeline 2014 -> 2020 (2010)

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# Final Decom Plan (FDP)

Chapter 1 – Introduction
Chapter 2 – Description of the Plant
Chapter 3 – Regulatory Framework
Chapter 4 – INPP Facilities Dismantling Option
Chapter 5 - Decommissioning Plan and Schedule
Chapter 6 – Radiological Inventory
Chapter 7 – The INPP-DP Technical Concept
Chapter 8 – Decontamination activities
Chapter 9 – Dismantling methods and tools
Chapter 10 – INPP Waste Management Strategy
Chapter 11 – Decommissioning Safety Assessment
Chapter 12 – Decommissioning EIA Programme, Reports and Data Sets
Chapter 13 – Radiation Protection Programme
Chapter 14 – Organisation performing Decommissioning
Chapter 15 – Decommissioning Costs and Funding
Chapter 16 – QA Programme
Chapter 17 – Final Radiation Survey
Chapter 18 – Facility and Site Restoration
Chapter 19 – The Final Decommissioning Report and License Termination
Chapter 20 – References

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# Chapter 9.
# DISMANTLING METHODS & TOOLS

An overview of the cutting techniques, reflecting the experience gained internationally over the last 10-15 years in the practical decommissioning field, is given in Section 6.3 of IAEA Technical Report No. 395 [1] and in Section 3.6 of IAEA Technical Report No. 401 [2].

Different segmenting techniques for highly radioactive equipment, including the reactor pressure vessel and internals of PWRs and BWRs, were developed and tested during immediate dismantling projects such as the WAGR in UK, Greifswald and Wuergassen NPPs in Germany; and the BR3 in Belgium.

Some additional feedback can be obtained from experience at some other facilities, such as graphite piles in UK and USA; Magnox Reactors in UK; UNGG in France; RBMK, AMB and other type of uranium-graphite reactors in Russia.

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# Chapter 9.
# DISMANTLING METHODS & TOOLS

The considerable experience gained in these industrial projects currently enables the selection and adoption of the appropriate segmentation techniques, on the basis of the shape, the geometry and the technical characteristics of the equipment to be cut, while:

- paying attention to the minimization of the secondary waste;
- optimizing the radiation protection of workers and public; and
- driving the costs down.

More detailed requirements concerning the segmenting tools to be used during dismantling activities related to INPP decommissioning are specified under **separate D&D projects, in particularly B9-0, B9-1, B9-2, B9-5 and are accepted as the base for the ongoing projects**

# DISMANTLING METHODS & TOOLS

## Classification and selection of the Segmentation Techniques

Basically, the segmentation techniques can be classified into the following categories:

- mechanical (including abrasive water jet cutting),
- thermal,
- electrical.

| Type | Technique | Speed | Thickness | Type of secondary waste | Example of applications in NPP decommissioning | Reasons for selection (+) / rejection (-) | Remarks |
|---|---|---|---|---|---|---|---|
| Mechanical | Milling cutter and circular saw | Medium | ≤ 200 mm | Swarfs (large) | Thermal shield (BR3) Core Support Structures | Little secondary waste, fast enough (+) | Remotely operated (under water); Horizontal and vertical cuts |
| | Band saw | Medium | Almost unlimited | Swarfs (small) | Core Support structures, plates, great variety of pieces, grids, ... | Little secondary waste, fast and extremely flexible (+) | Remotely operated |
| | Hydraulic jaw cutter | Fast | ≤Ø 60 x 2.5 mm | None | Tubes, pipes, cables, ropes | No secondary waste, fast, easy (+) | |
| | Reciprocal saw | Medium | ≤Ø 300 mm | Swarfs | Girders, pipes | Little secondary waste, small blade and kerf width (+) | |
| | Abrasive disc | Slow | Small pieces | Fine particles | Cold test only | Spread of contamination (-) | |
| | Nibbler | Fast | ≤10 mm | Chips | Steel sheets, tubes | Low secondary waste, fast easy (+) | |

# DISMANTLING METHODS & TOOLS

Table. Assessment of the main cutting techniques characteristics – benefits/drawbacks

| Type | Technique | Speed | Thickness | Type of secondary waste | Example of applications in NPP decommissioning | Reasons for selection (+) / rejection (-) | Remarks |
|---|---|---|---|---|---|---|---|
| Thermal | Plasma torch | Fast | ≤ 100 mm | Dross, particles, aerosols, fumes, dissolved ions | Thermal shield | Considered as promising due to high cutting speed; No further use due to secondary waste production (-) | Remotely operated; Vertical/horizontal cuts; 600 mm/min for 80 mm thick steel; 3500 mm/min for 10 mm thick steel; Cheap |
| | Arc saw | Fast | ≤ 250 mm | - same - | Test only | Very high power input, much secondary waste (-) | |
| | Laser Cutting | Fast | ≤ 10 mm | - same - | Confinement liner NPP Greifswald | Little secondary waste, small kerf | |
| Electrical | Electro-discharge machine (EDM) | Very slow | ≤ 80 mm | Fine particles, aerosols | Thermal Shield, reactor internal bolts | Very little force on the tool and on the piece, flexible for "surgical" operations (+) | Convenient for small and not easily accessible equipment; Remotely operated |
| Other | High Pressure water-jet cutting + abrasive | Medium to high in function of thickness | ≤ 150 mm | Fine particles (incl. abrasives) | Heat exchanger tube bundles Shell of heat exchanger RPV-Lid NPP Wuergassen | High consumption of (1.0 – 3.0 kg/min) + | 4000 bar; Remotely operated, Skilled operators required; Cost ± 0.7 MEUR; Yearly low doses; Abrasive recycling under development.. |

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# DISMANTLING METHODS & TOOLS.

## Basic Principles

Currently, miscellaneous proven cutting and segmenting tools and techniques are available for the dismantling of NPP's contaminated and activated equipment. However, three basic principles govern the selection of a cutting technique or tool for a given component:

***First Principle: Equipment Layout***

In addition to the material constituting the equipment, the layout of the equipment to be dismantled has a major impact on the dismantling/cutting techniques selection (further, in B9-X projects – D&D Tools). This mainly concerns:

- the assembly of the equipment,
- the dimensions of the equipment,
- the availability of space around and between the connections to other systems of the equipment.

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# DISMANTLING METHODS & TOOLS.

## Basic Principles

***Second Principle: ALARA Policy***

**ALARA** – (оптимизация радиационной безопасности, сокращение с английского «as low as reasonably achievable»). Один из основных принципов радиационной безопасности, утверждающий, что значение индивидуальных доз, предопределенных практической деятельностью, количество облучаемых людей и вероятность облучения должны быть настолько малы, насколько они могут быть возможны при рациональном использовании средств радиационной безопасности и с учетом социальных и экономических условий.

The segmented components are then transported by skips or boxes, hoisting devices and monorails into a mechanical workshop, installed in a lower ambient exposure background area, where further cutting of the components, in smaller parts, can be carried out. **The final dimensions of these smaller parts depend on the dedicated waste management routes selected for the components such as:**

- **super compaction,**
- **direct immobilization into the final disposal containers,**
- **decontamination by an external unit (batch decontamination operation) by a hard process**

Optimization of the overall process (handling/transportation/cut operations) may show that several final cutting facilities are needed.

# DISMANTLING METHODS & TOOLS.

## Basic Principles

***Second Principle: ALARA Policy***

Even after in-line decontamination, the residual ambient γ background around many equipment will exceed the maximum authorized level (≤12μSv/h at INPP) for continuous operation (1500 h/y) in the concerned areas. **Therefore, the number of cutting/segmentation operations, to be carried out in those areas, must be minimized to limit the exposure of the operators.**

The components should be cut in parts whose dimensions and weight are as large as possible but whilst remaining compatible with their handling and their removal outside of the irradiating area.

The segmented components are then transported by skips or boxes, hoisting devices and monorails into a mechanical workshop, installed in a lower ambient exposure background area, where further cutting of the components, in smaller parts, can be carried out. **The final dimensions of these smaller parts depend on the dedicated waste management routes selected for the components such as:**

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# DISMANTLING METHODS & TOOLS.

## Basic Principles

***Third Principle: Secondary Waste Minimization***

When selecting a cutting technique, particular attention must be paid to the minimization of the secondary waste production (liquid, solid and aerosols). The implementation of this principle, generally, leads to prefer mechanical cutting techniques to other ones such as plasma torch etc.

One additional drawback of the thermal cutting techniques lays into the fact that the metal is locally molten, implying a migration of the surface contamination into the base metal itself, rendering useless any subsequent chemical decontamination and, consequently, compromising the possibility to free release the components. This problem can only be solved by implementing a mechanical removal of such intrusive contamination by using handheld grinders or millers which of course might be also implemented to smoothen the sharp cutting edges due to conventional work safety reasons (risk of injuries).

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# DISMANTLING METHODS & TOOLS.

## Basic Principles

***D&D activities in the controlled area – ALARA policy***

Further to the establishment of a detailed radiological mapping in the working area, the implementation of the ALARA policy leads to organize the work in a three steps process:

***Step 1***: pre-cutting operations in the moderate to high radiation fields. This step may require floor pre-decontamination, the installation of appropriate shielding and confinement systems.

***Step 2***: transportation of the pre-cut components to the final dismantling unit, in a low ambient background area (containers, hoisting devices, etc.)

***Step 3***: final cutting operations and transportation of the segmented components to further treatment and/or conditioning units (decontamination, in the SWMSF, super-compaction or direct packaging).

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**B9X – D&D projects**

**IIDSF Decom PMU Phase 2 (01/2005 -> 12/2007)**

ToR

INPP Decommissioning Projects Pipeline 2007 -> 2013 (June 2006)

**IIDSF Decom PMU Phase 3 (01/2008 -> 12/2010)**

ToR

INPP Decommissioning Projects Pipeline 2014 -> 2020 (2010)

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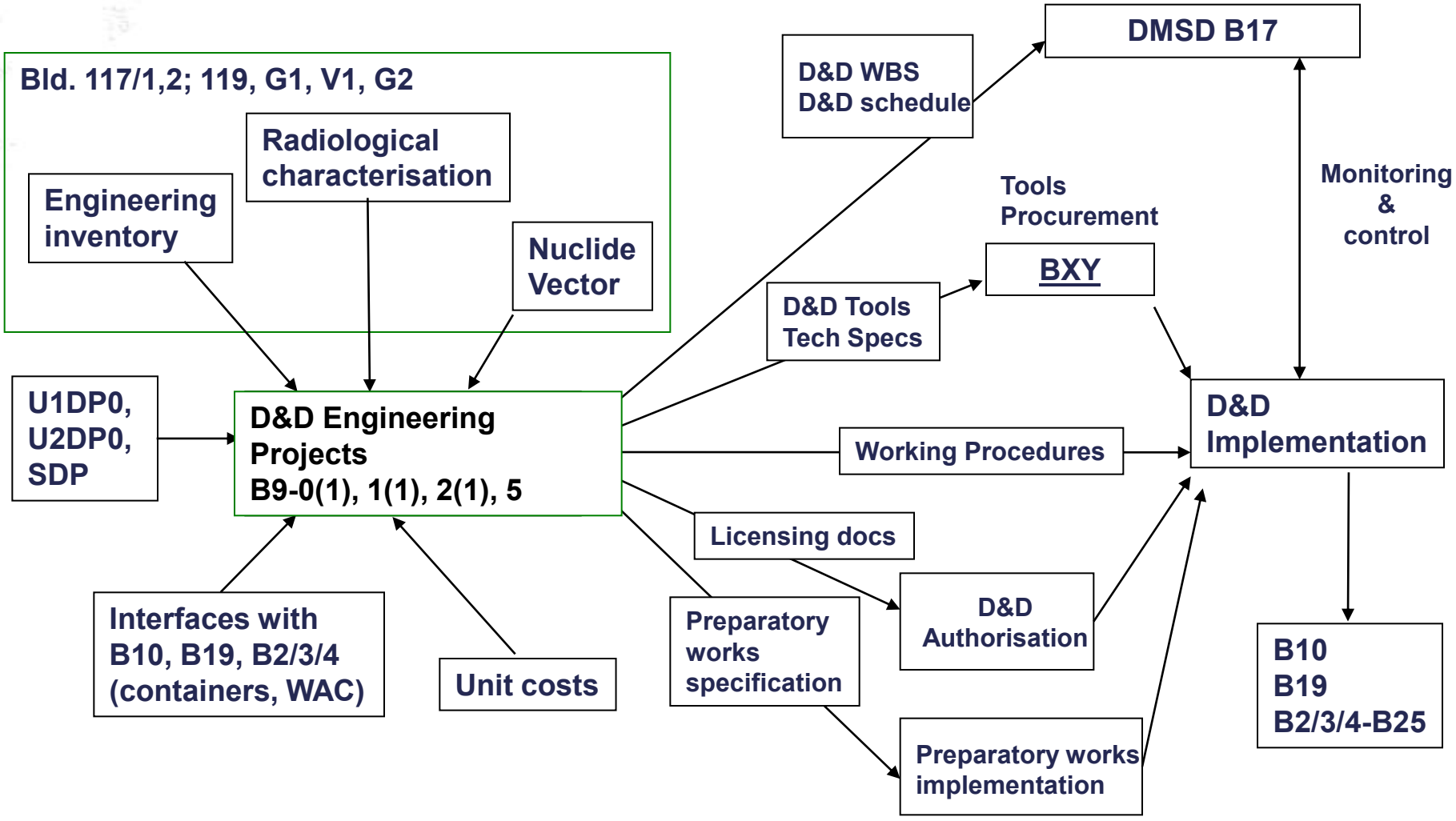
# B9s Progress Status

## *PROGRESS ON THE "IIDSF" D&D ACTIVITIES*

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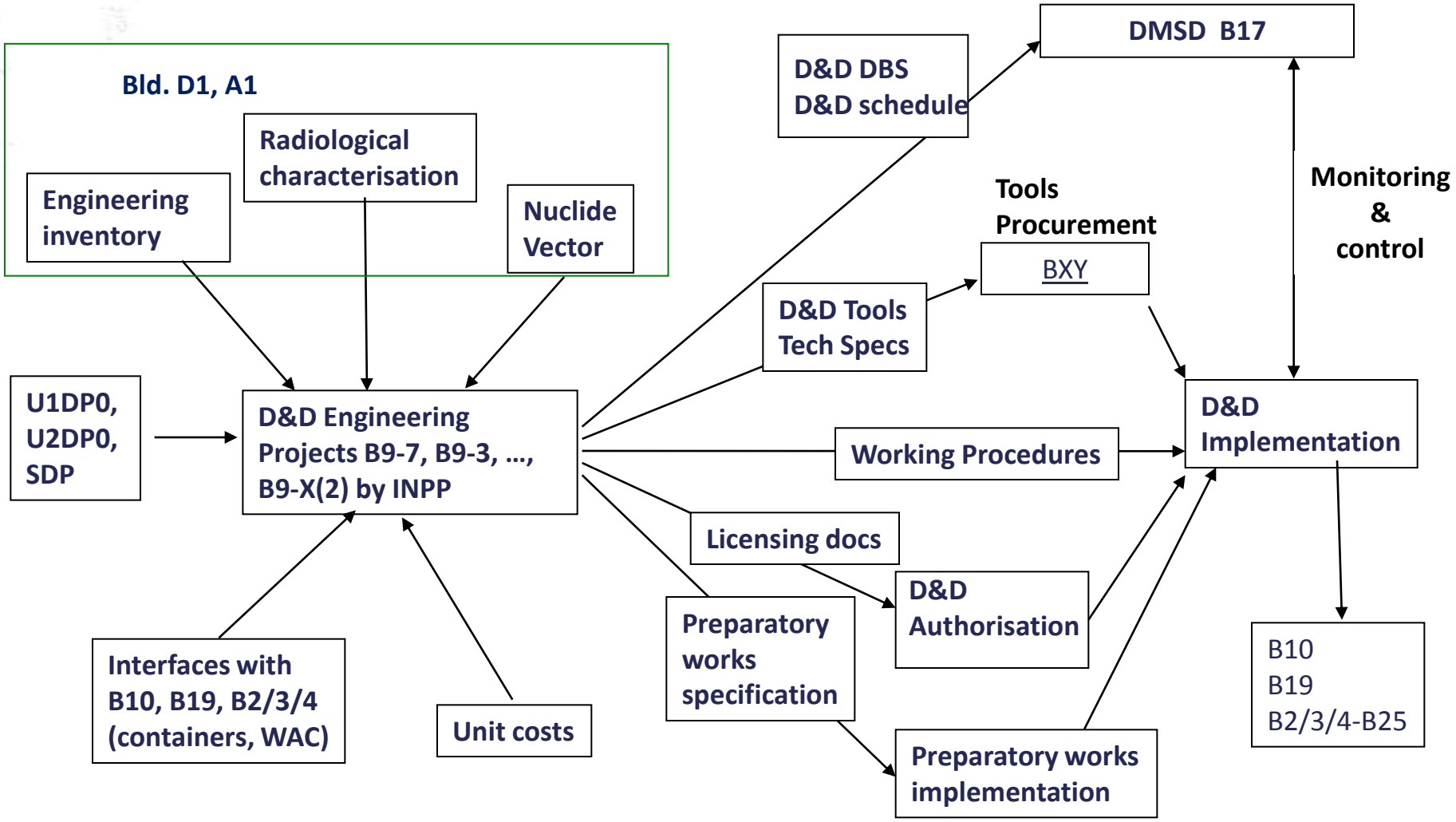
# B9s Progress Status

## *PRPARATION OF FUTURE D&D ACTIVITIES*

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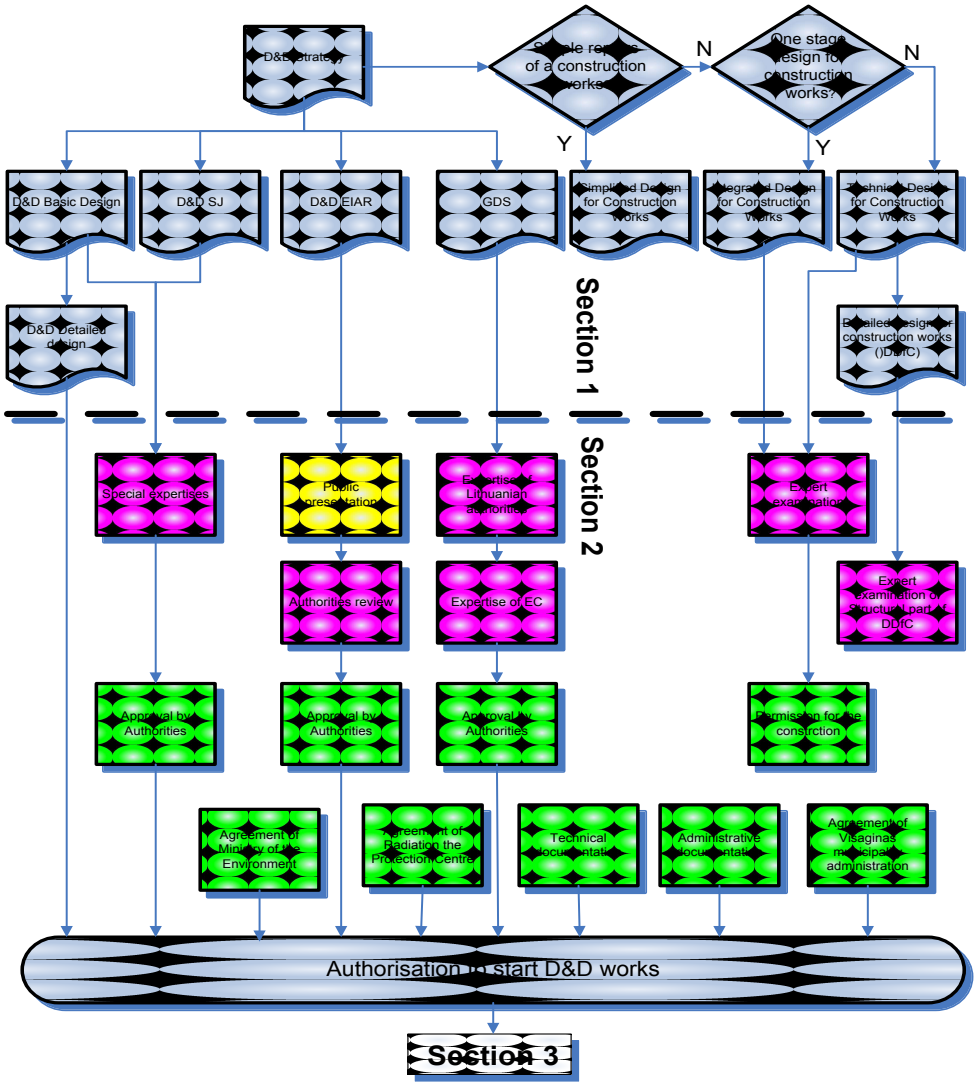
# Overview of activities related with licensing process of D&D projects at Ignalina NPP

- The licensing process used in Lithuania covers approval by the Authorities of the following documents:
  - D&D Basic Design,
  - D&D Safety Justification Report,
  - D&D Environmental Impact Assessment Report,
  - General Data Set on radioactive waste disposal plan
  - Design for Construction Works.
- The D&D documents such as Strategy, Detail Design including D&D working procedures, Operational and Maintenance Manual and Training programs may be inspected by the Authorities but not require approval from them.

# Overview of activities related with licensing process of D&D projects at Ignalina NPP

- Section 1 – documents development phase
- Section 2 – licensing phase
- Section 3 – work implementation

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# Overview of activities related with licensing process of D&D projects at Ignalina NPP

| ID | Licensing action | Involved authority |
|---|---|---|
| 1 | **EIA process** | Ministry of Environment, General public, VATESI, Ministry of Health, Fire and rescue department, Utena region environmental protection department, Cultural Heritage department, Utena region administration, Visaginas municipal administration |
| 2 | **Expertise of the D&D Basic Design and D&D SJ** | VATESI, Ministry of Environment, Ministry of Health (RPC), Visaginas municipal administration. |
| 3 | **Expertise of the Design for construction works**, when needed | Ministry of Environment, Certified expertise company |
| 4 | **Permission for construction (civil works),** when needed | Government or an institution authorized by it |
| 5 | **General data set on Radioactive waste disposal (Article 37 of Euratom Treaty)** | VATESI, Ministry of Environment, Radiation Protection Centre, Fire and Rescue Department of Ministry of the Interior, European Commission |
| 6 | **Authorization to start D&D works** | VATESI, Ministry of the Environment or an institution authorized by it, Radiation Protection Centre, Visaginas municipality |

# Expertise of the D&D Basic Design and D&D Safety Justification

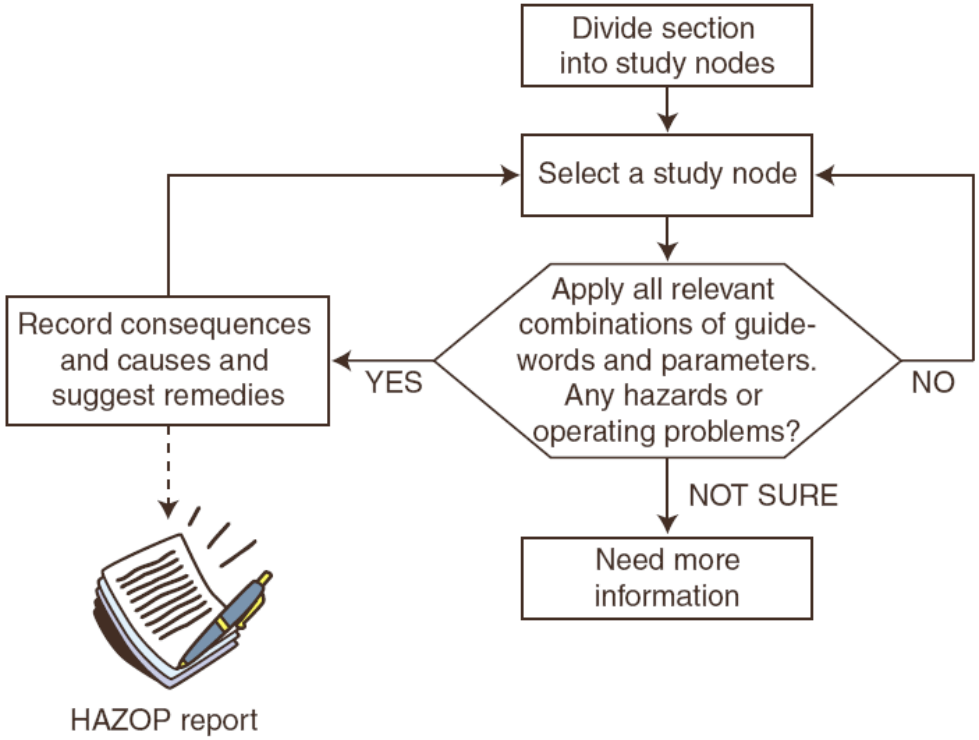
- The **D&D Basic Design** (or D&D Technological project) and **D&D Safety Justification** are main documents in the application for the implementation of D&D works.
- Licenses for the implementation of D&D works shall be issued by **VATESI** after **co-ordination** with **the Ministry of the Environment** (or an institution authorized by it), the **Radiation Protection Centre** and the director of **administration of the municipality**.

# Expertise of the D&D Basic Design and D&D Safety Justification

- For the licensing the D&D Basic Design and D&D Safety Justification documents are issued together as documents which support each other. Usually Basic Design document present technology proposed for the indicated D&D activities and Safety Justification report justify that proposed technologies can be applied in safe way.
- One of main part for the review is **fault schedule** and **accident analysis** sections of **Safety Justification** report.
- All **initiating events** possible during implementation of proposed D&D technology **shall be identified** and their **consequences shall be analyzed.**

# Expertise of the D&D Basic Design and D&D Safety Justification

- The Hazards and Operability Assessment (HAZOP) procedure was applied in the Ignalina NPP D&D projects for identification and preliminary analysis of the possible hazards, raised by the proposed D&D technology.

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# Expertise of the D&D Basic Design and D&D Safety Justification

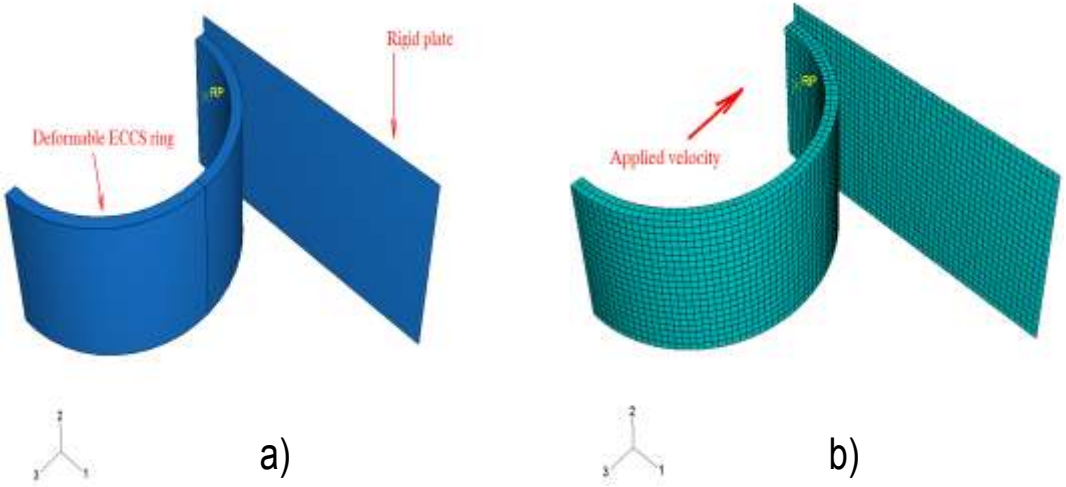
- It is well known that **D&D works**, especially with the clean or very low contaminated equipment, **mostly generate industrial hazards** such as **heavy load drops or workers injuries**.

- Any dismantling activity covers a lot of different operations related to cutting and lifting of different pieces of equipment. Dismantled equipment parts are lifted by a crane to transfer to storage or decontamination area.

- The consequences of an unlikely drop event shall be evaluated in the D&D safety justification report.

# Expertise of the D&D Basic Design and D&D Safety Justification

In the case of Ignalina NPP B9-0 project, as an bounding heavy load drop event, the drop of one-piece ring of ECCS vessel (3200 kg) from height 14 m was investigated in details.




# Expertise of the D&D Basic Design and D&D Safety Justification

- Together with the industrial hazards all **radiation protection issues** raised during D&D work implementation were analyzed in the Safety Justification Report.
- The performed analysis shall demonstrate that all individual and collective doses are below established radiation safety limit for individual dose – **18 mSv** per year and **20 mSv** per year (taking into account that effective dose limit for workers is **100 mSv** in a consecutive 5 year period).

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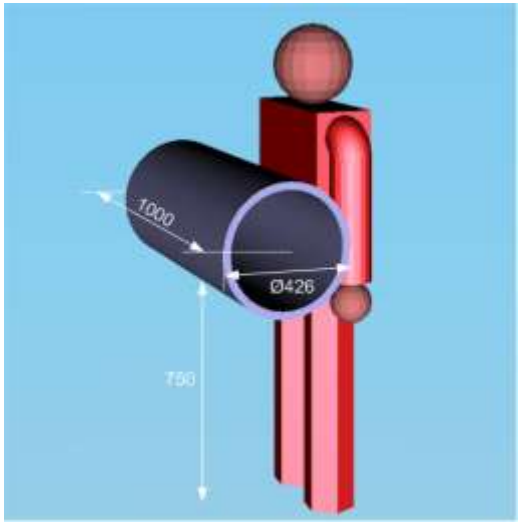
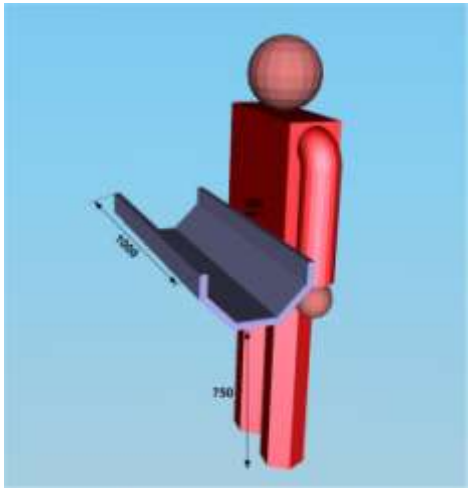
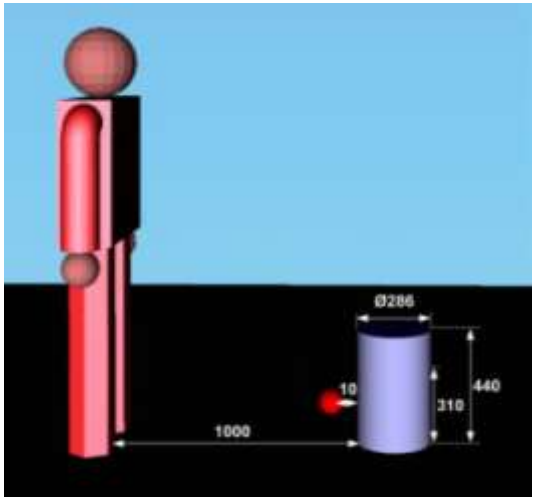
# Expertise of the D&D Basic Design and D&D Safety Justification

- External (direct) radiation by contaminated equipment was calculated using software “VISIPLAN ALARA Planining Tool”.

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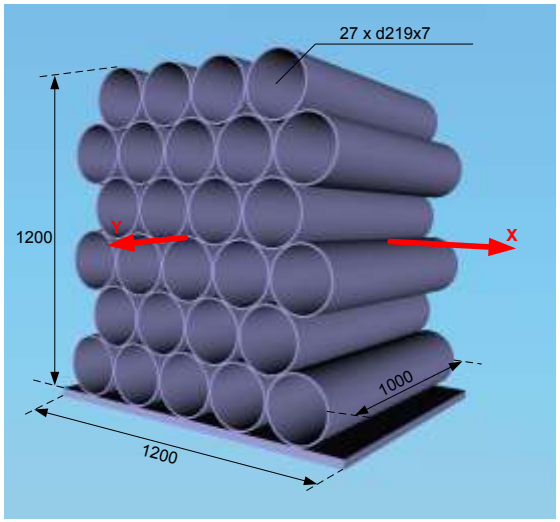
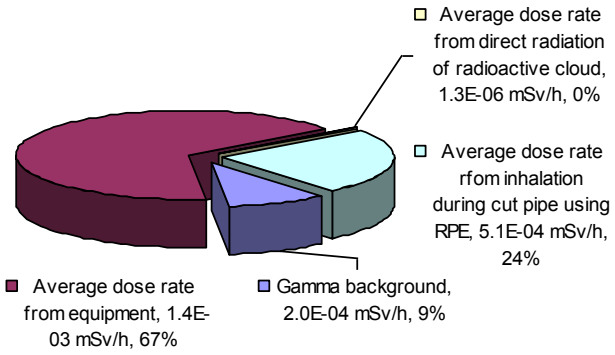
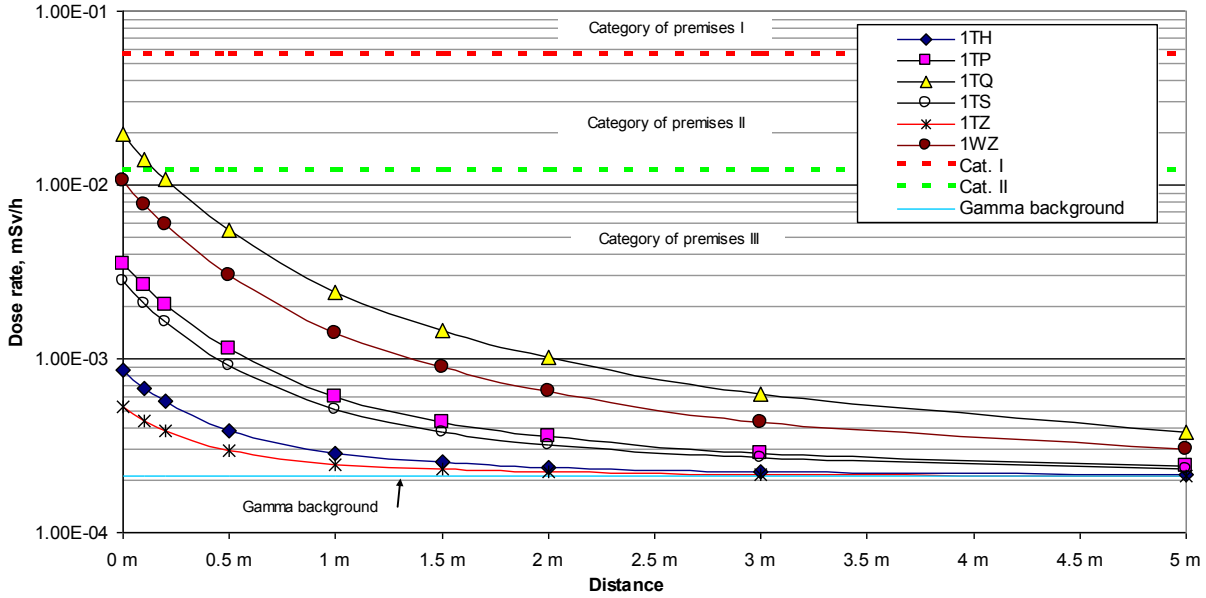
# Expertise of the D&D Basic Design and D&D Safety Justification

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# Licensing process of Environmental Impact Assessment report

The licensing process of the Environmental Impact Assessment Report is regulated in Lithuania by the Lithuanian Law on the EIA and Regulation. In the Law the following participants of the EIA process are defined:

- Responsible institution:
  - Ministry of Environment or other authorized by government institution;
- Subjects of environmental impact assessment of proposed economic activity:
  - State institutions responsible for public health, fire safety, protection of cultural heritage, institutions of district and municipality;
- Undertaker (client) of proposed economic activities;
- Developer of documentation on environmental impact assessment;
- Public.

# Licensing process of Environmental Impact Assessment report

- EIAR licensing process consists of the several steps:
  - Public presentation:
    - **within 10 working days** prior to the public presentation of EIA report all information is provided in the national and local press, on the Ignalina NPP and EBRD web-sites, as well on billboards in the Visaginas municipality.
  - Experts review include state institutions (EIA subjects) responsible for:
    - public health;
    - fire safety;
    - protection of cultural heritage;
    - institutions of district and municipality;
    - all institution have **20 working days** to provide the reasoned conclusions concerning the EIA report.

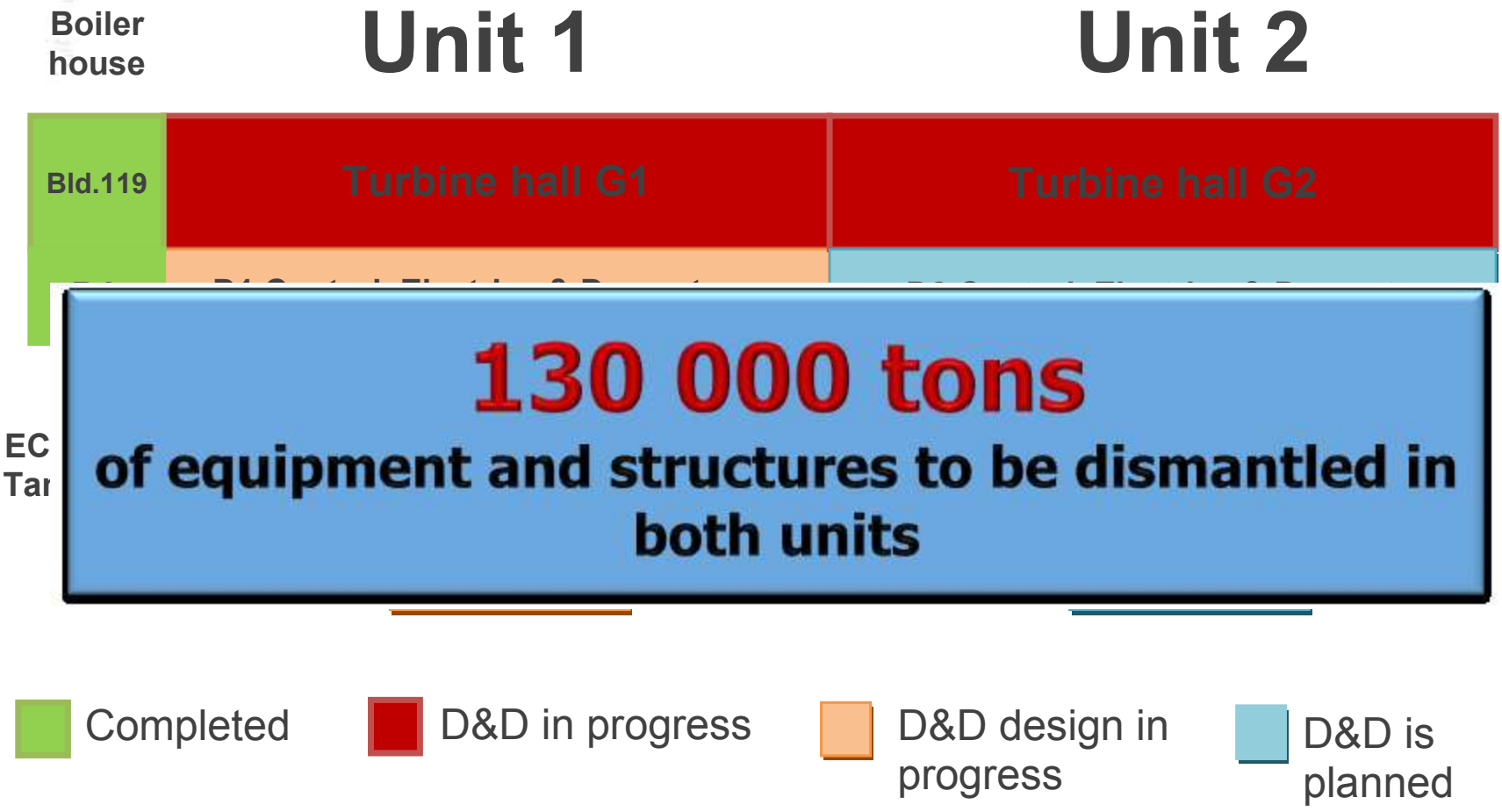
# Licensing process of Environmental Impact Assessment report

- Decision of the Responsible Institution:
  - When the conclusions from the EIA subjects are received EIA documentation is submitted to responsible institution (**the Ministry of Environment**).
  - The responsible institution, after receipt of the EIA report immediately organizes an **announcement on the web page** of the Ministry of Environment concerning the proposed activity.
  - The responsible institution **within 25 working days** upon receiving the report perform following actions:
    - submits reasoned requirements to correct or supplement the report,
    - or accepts the report.

# Licensing process of Environmental Impact Assessment report

- Public Information about Decision:
  - The responsible institution within **10 working days** from the acceptance of decision about the acceptability of the report, announces that information on the web page of the Ministry of Environment.
  - Ignalina NPP after receipt of the decision from the responsible institution, within 10 working days provides information to the public through the national and local press, as well as on billboards in the municipality.
  - At that point the complex review process of EIA report is finished.

# 1&2 Units D&D Activities: Status



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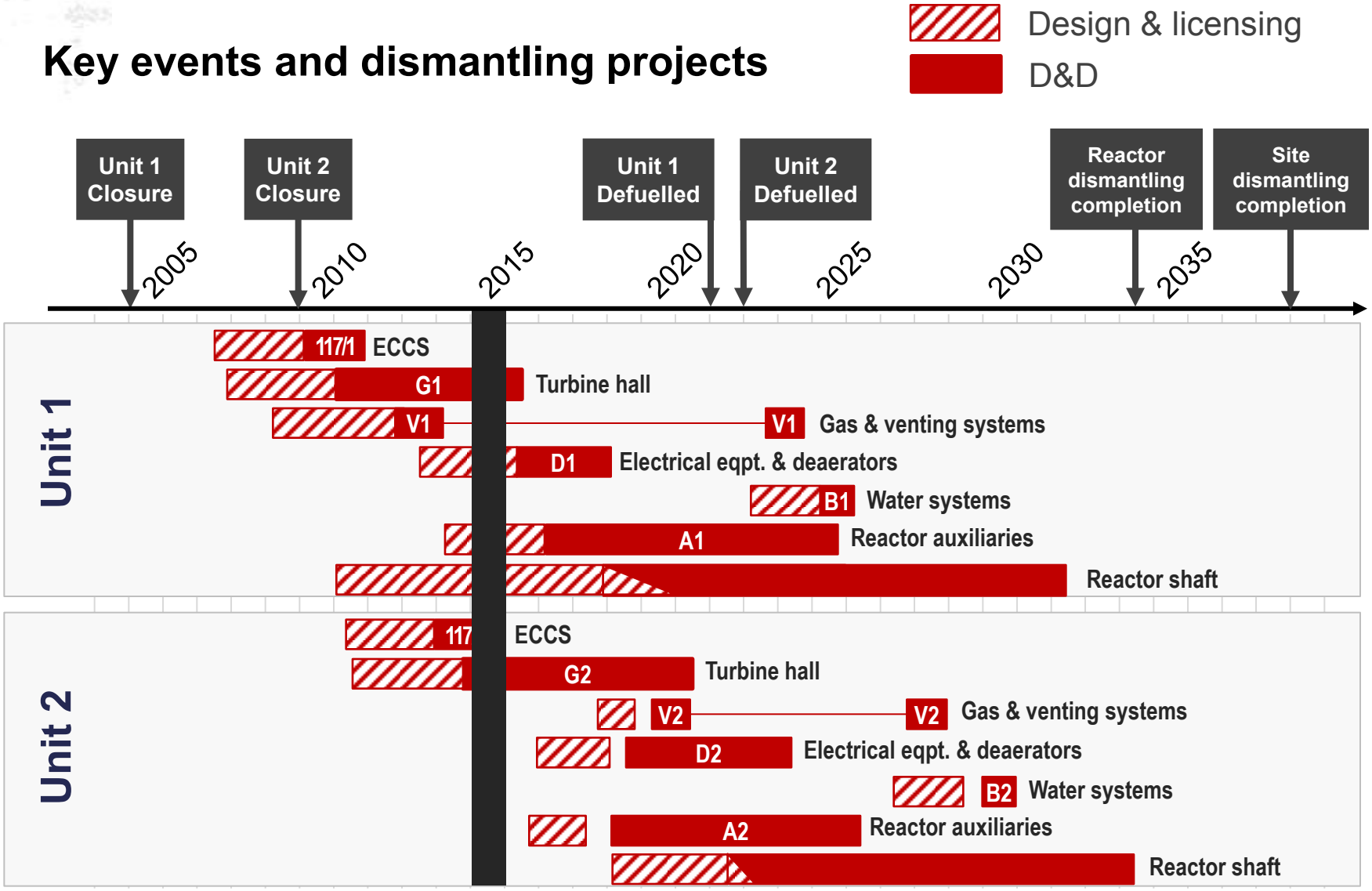
# Status and Schedule

## Key events and dismantling projects



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# D&D activities in 2010-2015 (completed D&D projects)

## Unit 1. Dismantling & decontamination Emergency Core Cooling System pressurized tanks and pipelines Bld. 117/1

**Project B9-0**
**Building 117/1 Equipment Decontamination and Dismantling Project Development**

**Contractor**: consortium Bobcock Nuclear Limited (formerly known as VT Nuclear Services (UK)), Lithuanian Energy Institute (LEI) and NUKEM GmbH (Germany).

The contractor prepared the Basic Design, Safety Justifications and Environmental Impact Assessment Report, as well as the Detailed Design and other documents necessary for the future works on INPP Building 117/1 systems and equipment dismantling and decontamination.

The Basic Design, Safety Justification and Environmental Impact Assessment Report are the documents which are agreed with the regulatory authorities – VATESI, the Ministry of Environment and the Ministry of Health. On the basis of these documents the operational license for performance of Building 117/1 dismantling and decontamination works was updated.


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# D&D activities in 2010-2015 (completed D&D projects)

Unit 1. Dismantling & decontamination Emergency Core Cooling System pressurized tanks and pipelines Bld. 117/1

View before D&D

View after D&D

Completed D&D projects.
900 tons were dismantled out of 960 tons in bld.117/1
Treated dismantling waste :
Free-release – 890 ton
Short-lived VLLW (Class A) - 55 ton placed into
Buffer Storage Facility Landfill (B19/1)



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# D&D activities in 2010-2015 (completed D&D projects)

Dismantling and Decontamination of Boiler House Equipment (bld.119)

**Project B9-5**

**BOILER HOUSE DISMANTLING AND DECONTAMINATION PROJECT DEVELOPMENT**

**Contractor**: Consortium consisting of UKAEA Ltd. - leading partner (United Kindom), Doosan Babcock Energy Ltd. (United Kingdom), Ernst & Young Baltic UAB (Lithuania), SWECO BKG LSPI (Sweden , Lithuania*),* IEEC UAB (Lithuania).

Once B9-5 project was completed, the total inventories are 1500 tones to be dismantled within the Building 119, majority of them are pumps and heaters, volume compensators, pipework and metallic structures



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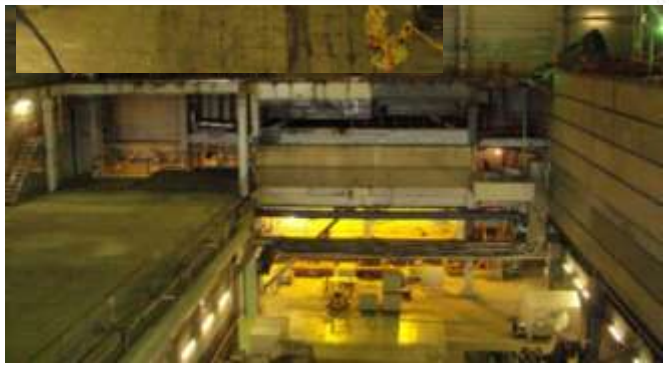
# D&D activities in 2010-2015 (completed D&D projects)

Dismantling and Decontamination of Boiler House Equipment (bld.119)

View before D&D

View after D&D

Completed D&D project.
The total volume of dismantled equipment is about 1500 tons, and these are belong to Class 0 (Free realise).
At present the building 119 is used for grinding, radiological measurements and packing of conditionally non-radioactive waste (waste of class 0)





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# D&D activities in 2010-2014 (completed D&D projects)

Dismantling and decontamination of equipment in Building V1 (Unit 1) - Reactor Gas Circuit & Ventilation Building

**Project B9-2**

**Bld. V1 equipment dismantling and decontamination project development**

**Contractor**: consortium Babcock Nuclear Limited (early known, as VT Nuclear Services (Great Britain)), the Lithuanian Energy Institute (LEI), NUKEM GmbH (Germany) and Ansaldo Nucleare S.p.A (Italy).

According to the contract, the Contractor had to develop the set of the documents including the technological design, safety analysis report, environmental impact assessment report, detailed design and other documents required for dismantling and decontamination activities performance.

In total, 1179 tons of the equipment (pipelines, valves, compressors, filters, heat exchangers, electric equipment, etc.) will be dismantled at Bld. V1.



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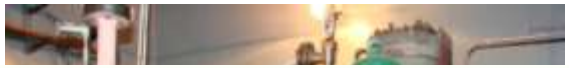
# D&D activities in 2010-2014 (completed D&D projects)

Dismantling and decontamination of equipment in Building V1 (Unit 1) - Reactor Gas Circuit & Ventilation Building

View before D&D



View after D&D

In January 2014 Phase D1 of project has been completed.
About 600 tons (54%) of equipment and systems were dismantled.
Treated dismantling waste :
Free-release – 482 ton
Short-lived WLLV (Class A) -118 ton placed into Buffer Storage Facility Landfill (B19/1)



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# D&D activities in 2010-2015 (ongoing D&D projects)

Dismantling and decontamination of Equipment in Building G1 - Turbine Hall of Unit 1

**Project B9-1**
**Unit 1 Turbine Hall equipment decontamination and dismantling project development**
**Contractor**: Consortium consisting of UKAEA (formerly United Kingdom Atomic Energy Authority) - the leader of consortium (United Kingdom), Grontmij (United Kingdom), Ernst & Young Baltic UAB (Lithuania), SWECO BKG LSPI UAB (Sweden , Lithuania*).*
**Project Key Objectives**:

- Work out the technical documentation package that enables the dismantling and decontamination of the Unit 1 Turbine Hall redundant equipment and to manage waste arising by the most effective and safe manner;
- Obtain permission from the Lithuanian regulatory authorities for implementation of the planned activities;
- Carry out consultancy support for the implementation of the dismantling and decontamination.


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# D&D activities in 2010-2015 (ongoing D&D projects)

Dismantling and decontamination of Equipment in Building G1 - Turbine Hall of Unit 1

View before D&D

View after D&D

Project ongoing.
At present 16000 tons of equipment were dismantled out of 17 868 tons



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# D&D activities in 2010-2015 (ongoing D&D projects)

Project “Dismantling of Bld. G1 equipment”, Turbine Hall Unit 1.

View before D&D

View after D&D

Treated dismantling waste :
Free-release – 11000 ton
Short-lived VLLW (Class A) -1900 ton placed into Buffer Storage Facility
Landfill (B19/1)

Progress of turbine №1&2 equipments dismantling



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# D&D activities in 2010-2015 (completed D&D projects)

Unit 2: Dismantling and decontamination Emergency Core Cooling System pressurized tanks and pipelines Bld. 117/2

View before D&D

View after D&D

Completed D&D projects.
910 tons were dismantled out of 975 tons in bld.117/2
Treated dismantling waste :
Free-release – 890 ton
Short-lived WLLV (Class A) -19 ton placed into Buffer Storage Facility Landfill (B19/1)



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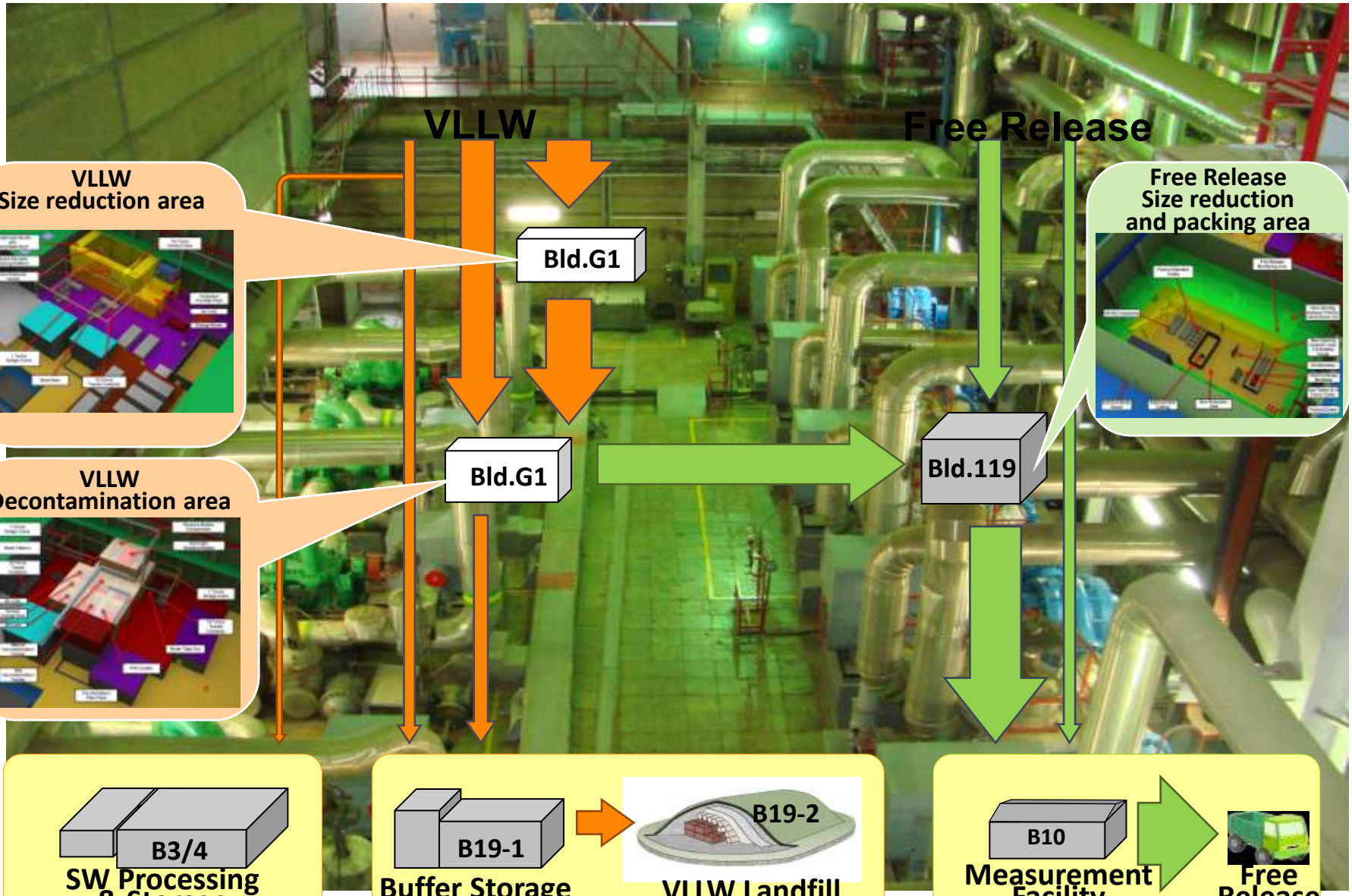
# Cutting, dismantling and decontamination technologies and facilities

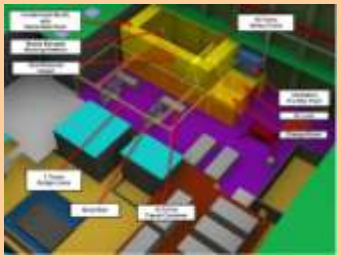


# Cutting, dismantling and decontamination technologies and facilities

Containment Booth with Retractable Roof

15 Tonne Gantry Crane

**VLLW Size reduction area**



VLLW Decontamination area


B3/4

SW Processing & Storage

Buffer Storage

VLLW Landfill

Measurement Facility

Free Release

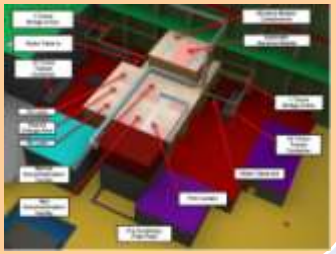
# Cutting, dismantling and decontamination technologies and facilities

1 Tonne Bridge Crane

Abrasive Blaster Containment

VLLW Size reduction area

**VLLW Decontamination area**



B3/4 SW Processing & Storage

Buffer Storage

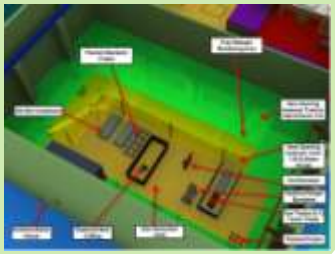
VLLW Landfill

Measurement Facility

Free Release

# Cutting, dismantling and decontamination technologies and facilities

**Free Release**
**Size reduction**
**and packing area**



Packed Drums

Storage

Free Release


# Thank you

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